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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,552	01/23/2004	Heinz H. Busta	100170	7551

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EXAMINER

PERRY, ANTHONY T

ART UNIT	PAPER NUMBER
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2879

MAIL DATE	DELIVERY MODE
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05/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,552	BUSTA	
	Examiner	Art Unit	
	Anthony T. Perry	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/26/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 27-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-18,20-22 and 24-26 is/are rejected.
- 7) ☐ Claim(s) 2,19 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/23/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 recites the limitation "the layer of conductive material" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 8, 10, 11, 12, 14, 15, 16, 17, 20, 21, and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al. (US 5,912,531).

Regarding claims 1, 3, 10, 11, 12, 14, 15, 16, 20, and 21 Hasegawa et al. teach a vacuum tube and a method of operating the vacuum tube, wherein the vacuum tube comprises a glass housing (88), and a layered conductive rod, which acts as an electron source and comprises a rectangular central conductive rod (62) having a base (65) and side walls; a first insulating layer (67) covering the side walls; and a field emitter layer (64) covering the first insulating layer (67), wherein the first insulating layer (67) and the field emitter layer (64) form concentric layers around the side walls of the central conductive rod (62), and the base (65) of the central

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conductive rod (62) is exposed and side walls are layered in a proximity of the base (65) (For example, see Figs. 6A, 6B, and 8).

Regarding claim 5, Hasegawa et al. teach the central conductive rod (62) being copper or tungsten (for example, see col. 9, lines 15-31 and col. 15, lines 15-31).

Regarding claims 8 and 17, Hasegawa et al. teach the field emitter layer being a carbon-based material (for example, see col. 7, lines 5-19).

Regarding claim 25, Hasegawa teach conductive material (86) covering a portion (84) of the housing (88).

Claims 1 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Laul (US 4,757,524).

Regarding claims 1 and 16, Laul teaches a vacuum tube comprising: a housing (16); and a layered conductive rod positioned in the housing, the layered conductive rod including a central conductive rod (11) having a base and side walls; a first insulating layer (12) covering the side walls; and a field emitter layer (22) covering the first insulating layer (12) (see Fig. 1).

Claims 1, 3, 5, 6, 7, and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Morimoto et al. (US 5,066,885)

Regarding claims 1, 3, 5, and 10-14, Morimoto teaches a layered conductive rod, which acts as an electron source and comprises a cylindrical central conductive rod (1) made of tungsten and having a base and side walls; a first insulating layer (2) which is recessed from the base and that covers the side walls; and a field emitter layer (5) covering the first insulating layer (2), wherein the first insulating layer (2) and the field emitter layer (5) form concentric layers around the side walls of the central conductive rod (62), and the base of the central conductive rod (1) is exposed and side walls are layered in a proximity of the base (for example, see Fig. 1).

Regarding claims 6-7, Morimoto teaches the central conductive rod having comprising a rod (1)

comprising conductive material, tungsten, and a conductive layer (3) covering the rod (1) (for example, see Fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 9, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US 5,912,531).

Regarding claim 4, Hasegawa does not specifically teach the diameter of the central conductive rod in the range of 200 to 1000 microns. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an appropriate range for the diameter of the central conductive rod, since optimization of workable ranges is considered within the skill of the art.

Regarding claims 9 and 18, Hasegawa does not specifically recite the carbon electron emitting material being in the form of carbon nanotubes. However, it is well known in the art of FEDs to use carbon nanotubes as the emitting layer because they are highly efficient emitters due to their small emission cites. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use carbon nanotubes as the carbon emitting material layer of the Hasegawa invention to provide an FED with enhanced emission characteristics and a higher luminance.

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Regarding claim 24, Hasegawa teaches a getter being included within the housing (88), but does not specifically recite that it is in the form of a bead. However, when using a getter in an FED, it is conventional to use a getter bead. The getter bead is typically heated by an outside source in order to absorb impurities within the envelope maintaining an appropriate vacuum level (col. 17, lines 14-23). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a getter bead within the container of the Hasegawa reference in order to absorb impurities which may hamper proper operation of the device.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laul (US 4,757,524) in view of Greenwald et al. (US 6,661,875).

Laul does not specifically teach the X-ray generator having a housing in the form of a catheter. However, it is known in the to house an X-ray generator in a catheter. Greenwald teaches that miniature x-ray generators housed in a catheter for providing a biologically effective dose of X-ray radiation, that is superior to using radioactive isotopes, in that it can produce an energy spectrum and/or dose rate that can be varied over a relatively wide range. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to house the x-ray generator in a catheter so that it can be used for preventing restenosis in blood vessels after that have undergone angioplasty, for treating tumors, etc.

Allowable Subject Matter

Claims 2, 19, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Prior art fails to disclose or fairly suggest:

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- A second insulating layer that covers the field emitting layer which covers the first insulating layer, in combination with the remaining claimed limitations as called for in claims 2 and 19;
- A vacuum tube that further comprises a second conductive rod positioned in the housing opposite the base of the central conductive rod in combination with the remaining claimed limitations as called for in claim 23.

Contact Information

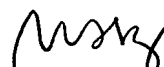
Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is **(571) 272-2459**. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. **The fax phone number for this Group is (571) 273-8300.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Anthony Perry
Patent Examiner
Art Unit 2879
April 30, 2007



MARICELI SANTIAGO
PRIMARY EXAMINER